

### **REMARKS**

Reconsideration and allowance of the subject application are respectfully requested.

#### **A. Summary of the Interview**

Applicants and Applicants' attorney appreciate the courtesies extended during the personal interview conducted on April 14, 2004. In accordance with MPEP §713.04, the following is a brief summary of the interview. The interview was conducted with Supervisory Primary Examiner (SPE), John Lee, the acting Examiner, Bernard Souw, another interested Examiner, Nikita Wells, the two inventors Arzhang Ardavan and Houshang Ardavan, and Applicants' attorney, John Lastova. The inventors presented the underlying physics of their invention, showed pictures of an experimental prototype apparatus, and explained experimental results generated from testing the prototype that demonstrate the utility and operability of their invention. The applied prior art was addressed, and independent claim 21 was distinguished therefrom. It was pointed out that none of the prior art applied by the Examiner discloses or suggests accelerating a charge or current distribution at superluminal speed to produce non-spherically decaying electromagnetic radiation. The objections raised by the Examiner with respect to the "use" claims in the rejections under 35 U.S.C. §112, second paragraph were discussed and resolved. As recorded in the Interview Summary Form PTOL-413, SPE Lee provisionally withdrew all rejections of record pending review of Applicants' Response,

which will include a Declaration and the experimental data presented during the interview.

**B. The Claimed Invention Is Useful**

The Office Action objects to the specification arguing that certain words are not used in conformity with the "general terminology accepted in the art." Applicants respectfully disagree. First, the Examiner provides no *evidence* to support the contention that any words used in the specification do not conform with the general terminology accepted in the art. Second, a person of ordinary skill in the art would understand, in the context of the entire application, that the word "emissions" refers to electromagnetic radiation and that the word "decay" means an attenuation or fall-off of that electromagnetic radiation as one moves away from the source of that electromagnetic radiation. The word "rate" refers to how quickly that electromagnetic radiation attenuates/decays as a function of distance from the radiation source.

The Examiner contends that the intensity of a laser beam does not decay over a significant distance R. Applicants respectfully disagree. It is well known that in the far field or zone, (i.e., beyond the Fresnel or Rayleigh range), the intensity of the electromagnetic radiation from lasers normally diminishes like  $1/R^2$ , where R is the distance from the laser.<sup>1</sup>

The Examiner alleges that certain "inconsistencies" in the application border on "incredible." Applicants respectfully disagree for the reasons set forth during the

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<sup>1</sup> See A.E. Siegman, "Lasers," Oxford University Press, 1986, pages 669-671.

interview. For example, the Examiner mischaracterizes what is moving at superluminal speed. The electromagnetic waves are not moving at superluminal speeds. Rather, it is a polarization or magnetization current or charge *distribution* that moves with superluminal speed. This current or charge distribution is sometimes referred to as a "source" in the sense that it is the source that generates the electromagnetic radiation.

The Examiner essentially restates the same incredibility objections throughout the Office Action and concludes by rejecting claims under 35 U.S.C. §101 contending that the claimed invention lacks a utility. The Examiner's rejection is in error.

To sustain a lacking of finding utility, there must be proof of total incapacity. *Juicy Whip Inc. v. Orange Bang Inc.*, 51 USPQ 2d 1700, 1702 (Fed. Cir. 1999). Evidence submitted by the Applicant to rebut the finding need only (1) "explicitly identify a specific and substantially utility for the claimed invention," and (2) "provide evidence that one of ordinary skill in the art would have recognized that the identified specific and substantially utility was well-established at the time filing." MPEP §2017, at pages 2100-2130. Applicants need only come forward with evidence that the invention is capable of performing some beneficial function or achieving some useful result. *Juicy Whip Inc. v. Orange Bang Inc.* at 1702. There is no requirement that Applicants prove an asserted utility beyond a reasonable doubt, *In re Irons*, 144 USPQ 351, 354 (CCPA 1965), or that an asserted utility is established as a matter of statistical certainty. *Nelson v. Bowler*, 206 USPQ 881, 883-884 (CCPA 1980).

Evidence submitted by Applicants directly rebuts the Examiner's incredibility contentions and demonstrates the utility of the claimed invention. That evidence includes two Bolotovski articles cited and discussed in the specification at page 3, lines 10-20, (copies of these articles are included in the Information Disclosure Statement submitted with this response), the expert testimony of Dr. Dwight Rickel submitted in a Rule 132 Declaration, and a description of an experiment performed by the inventors using the invention along with specific experiment results (submitted as exhibits C and D with Dr. Rickel's Declaration).

Before the filing of this application, the Bolotovski articles established in the technical literature that coordinated motion of aggregates of charged particles can give rise to extended electric charges and currents whose distribution patterns propagate with a phase speed exceeding the speed of light in a vacuum, and that once created, such propagating charge distribution patterns act as sources of electromagnetic fields in precisely the same way as any other moving sources of fields. As the specification explains on page 3, the fact that these sources:

travel faster than light is not, of course, in any way incompatible with the requirements of special relativity. The superluminally moving [charge or current distribution pattern] is created by the coordinated motion of aggregates of subluminally moving particles.

Dr. Dwight Rickel is an expert in the technical field of this invention. See Rickel Declaration, ¶¶ 1-3. Dr. Rickel confirms that the claimed invention does not violate known laws of nature, including the special theory of relativity. Rickel Declaration, ¶7.

" There is no *material object* accelerated to a superluminal speed in a vacuum. Again, it is the *current distribution* which reaches superluminal speed. Rickel Declaration, ¶'s 5 and 7. Simply stated, what Applicants' claim to be moving faster than light is the source of the radiation (a current distribution) and not the electromagnetic waves that correspond to the actual radiation generated by the source. *Id.*

Dr. Rickel also confirms that the invention generates a cusp of intense radiation that is not produced by conventional radiation sources. Rickel Declaration, ¶ 8. Dr. Rickel states in ¶ 8:

Moving away from the distribution, more wavelets converge on the cusp giving rise to non-spherical decay in the far field better than  $1/R^2$ .

The experiments conducted by the inventors to test the viability of the invention and described in exhibit C of the Rickel declaration was validated by Dr. Rickel. Rickel Declaration, ¶ 10. Figure 3 of the test results in exhibit D confirms, as explained in the Rickel Declaration, ¶ 11, that:

[t]he radiation intensity in Figure 1 decays at a rate of approximately  $1/R^2$  once account is taken of interference from the ground, while the slope of a line corresponding to that ratio confirms that the intensity in Figure 2 decays at a rate of approximately  $1/R$ , where  $R$  is the distance from the charge or current distribution.

Non-spherically decaying electromagnetic radiation clearly has a plethora of beneficial uses. Various example and non-limiting uses are set forth in the claims, described in the application, and identified by Dr. Rickel. Rickel Declaration, ¶6.

SPE Lee found the utility explanation and evidence to be persuasive and provisionally withdrew all §101 and §112, first paragraph objections and rejections. Formal withdrawal of those rejections is respectfully requested.

**C. The Use Claims Are Permissible**

The Examiner objected to claims 30-49 because they are "use" claims. Those claims were discussed during the interview, and in large part, SPE Lee found them to be acceptable. Several amendments have been made to certain ones of those claims pursuant to the suggestions made by SPE Lee. Withdrawal of the objection to claims 30-49, (several of which have been canceled without prejudice or disclaimer), is respectfully requested.

**D. The Claims Distinguish From the Applied Prior Art**

Claims 21-22 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,704,355 to Bridges. This rejection is respectfully traversed.

To establish that a claim is anticipated, the Examiner must point out where each and every limitation in the claim is found in a single prior art reference. *Scripps Clinic & Research Found. v. Genentec, Inc.*, 927 F.2d 1565 (Fed. Cir. 1991). Every limitation contained in the claims must be present in the reference, and if even one limitation is missing from the reference, then it does not anticipate the claim. *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565 (Fed. Cir. 1986). Bridges fails to satisfy this rigorous standard.

Before addressing the specific prior art, Applicants want to address the characterization of the invention in the official action. The Examiner states that the invention is nothing more than laser beaming or a phased array antenna. These characterizations are not correct. As explained during the interview and confirmed by Dr. Rickel, the "intensity of laser radiation diminishes with the distance  $R$  from its source like  $1/R^2$  in the far field, i.e., where  $R$  is greater than the Fresnel distance." Rickel Declaration, ¶9. Thus, laser radiation decays spherically rather than non-spherically in the far field. Moreover, the "claimed apparatus is not just another phased array because it generates an intense energy cusp as described in the specification and illustrated in Figures 3, 4, and 9." *Id.*

Bridges discloses a non-invasive system for breast cancer detection. Bridges lacks a "means for generating, in a control manner, a polarization or magnetization current or charge distribution having an accelerated motion with a superluminal speed," as recited in claim 21." Bridges also fails to disclose or suggest that such an apparatus generates "non-spherically decaying electromagnetic radiation." This rejection should be withdrawn.

Claims 23-24 and 26-28 stand rejected under 35 U.S.C. §103 as being unpatentable over Bridges, in view of Miller or Nunnally, and further in view of Zucker. Claims 25 and 29 stand rejected under 35 U.S.C. §103 as being unpatentable over Bridges, in view of Fay.

As explained during the interview, the secondary references fail to overcome Bridges' deficiencies with respect to independent claim 21. Thus, even if the proposed combinations could be made, none of them would disclose or suggest generating a polarization or magnetization current or charge distribution having an accelerated motion with superluminal speed or a distribution that generates non-spherically decaying electromagnetic radiation.

For the reasons set forth above and during the interview, Applicants respectfully submit that the outstanding prior art rejections must be withdrawn in accordance with SPE Lee's provisional withdrawal. Applicants have also added new claims 50-80. Claims 50-60 are further dependent claims. Claims 61-71 recite a method for generating an electromagnetic radiation where a current or charge distribution having accelerated motion with superluminal speed produces non-spherically decaying electromagnetic radiation. This method is not disclosed or suggested by the prior art references applied by the Examiner in the first Office Action. Claims 72-80 recite an apparatus for generating electromagnetic radiation in which the charge or current distribution "generates electromagnetic radiation whose intensity attenuates at a rate  $1/R^x$  in a far field, where  $R$  is a distance from the charge or current distribution and  $x$  is less than 2." As explained during the interview, none of the prior art references describes generating electromagnetic radiation with this significant and beneficial property. Indeed, the intensity of the electromagnetic radiation generated by these prior art references attenuates at a rate of  $1/R^2$  in the far field.




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The application is in condition for allowance. An early notice to that effect is earnestly solicited.

Respectfully submitted,

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